LITHOGRAPHY IN INDIA

ABRAHAM

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LITHOGRAPHY IN INDIA:

BEING

A FEW PRACTICAL HINTS FOR THE INDIAN AMATEUR.

BY

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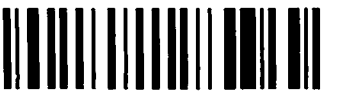
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PREFACE.

THE want of a practical Guide to the Art of Lithography compiled from Indian experience, has induced the Writer to make the attempt to supply one, which he hopes will be found useful by the Amateur in this Country. The information it contains will, at all events, be a stepping-stone to the further adaptation and improvement of the Art.

The Writer by no means claims the merit of originality for his expositions: they are but a collection of facts noted during some years experience in several of the largest Establishments in this Presidency, and he publishes his Hints for the benefit of those who have not had like facilities for acquiring proficiency in Indian practice.

January 1864.

LITHOGRAPHY IN INDIA.

PART I.

HISTORY OF LITHOGRAPHY.

ALOIS SENEFELDER, the discoverer of this useful art, was a native of Bavaria. He was of poor but respectable parentage, had the advantage of a liberal education, and was allowed to follow the bent of his own inclination, which led him to try various means whereby to improve his circumstances. Failing in many of his attempts, he hit upon the idea of becoming an author; but fortune seemed to fail him here also, for he had not the means of defraying the charges for publishing his book. He now determined upon becoming his own printer, and for this purpose taxed his inventive talents, till he succeeded in discovering the art of lithography.

It is said that this was a result purely accidental. While Alois was busily engaged essaying on different materials, which he had procured, and had lying about in his laboratory, his mother one day entered the room, and asked him to take down the washerwoman's account. There being no paper at hand, he wrote it

with one of his chemical inks on a polished slab, intending to copy it at his leisure. When he was about to do so, it occurred to him, that by corroding the surface of the stone with acid, the letters would stand out in relief, and admit of an impression being taken from them. He tried the experiment, and succeeded; and also soon found that it was not absolutely necessary to lower the surface of the stone, but that simply wetting it was sufficient to prevent the printing-ink adhering to any part except that marked by the composition.

Having made considerable improvements, Senefelder obtained a patent, entered into business, and opened establishments in various parts of Europe.

Since then, the art has made rapid progress, and has flourished to a greater extent than the inventor could have anticipated.

PART II.

PRACTICE OF LITHOGRAPHY.

General Remarks.—The process depends upon the innate quality which compact calcareous stone possesses for absorbing grease and water with avidity; and the antipathy these bear to each other assists the printer. On the surface of a prepared calcareous stone, a drawing is executed with chemical chalk, or ink; the stone is then sponged with water, rolled over, while wet, with printing-ink, which combines chemically with the greasy lines on the stone; a sheet of paper laid on its surface, the whole passed through the press, and a *fac simile* impression obtained.

As simple as the above process appears, it is nevertheless attended with many difficulties, which are only surmounted by skilful manipulation of the various materials used.

Besides the press and stones, the following are requisites: transfer-paper, transfer-ink, lithographic ink and chalk, rolling-ink, brass rulers (parallel and rolling), drawing and writing pens (steel and quill), sponge, gum, acid, water of Ayr and pumice stone, files, rasps, sand, china saucers for ink, phials for acids, &c., and a couple of copper vessels with close-fitting covers.

Lithographic Presses.—There are three descriptions of presses in use in India,—cylindrical, lever, and eccentric lever. Of these the last is the best, it being better adapted than either of the others to produce the finest impression required, by means of the powerful leverage it brings into operation, which causes the paper to take up the printing-ink at each impression sharp and clean, and prevents it running and becoming blotched. It is also particularly portable. However, for facility in producing large quantities of work, it does not surpass the common lever press.

Stones.—Stones which absorb grease and water with facility, and effervesce on the application of acid, are those best adapted for lithographic purposes. No description possesses these qualities in a more eminent degree than compact calcareous stone; and the following hints will be useful in selection, and preparation for use.

The best stone breaks with a conchoidal fracture; on breathing on it, a clayey smell is perceived; colour light straw.

The stones are prepared for chalk drawings, or writing, by grinding them face to face with sifted sand, sprinkled with water. The motion may be either parallel or circular,—the latter for chalk-drawings. By this operation the surface is granulated, and the requisite degree of smoothness and evenness obtained. The stones should, in the first instance, invariably be prepared by parallel grinding, until all traces of

scratches or stains are removed, and a uniform surface obtained; and then grained. When required for the reception of writing, instead of being grained, they are polished with pumice stone, and finished with water of Ayr stone. The sand generally used in grinding is of a yellow colour: silver sand is suitable for the purpose, but, being expensive, may be dispensed with where any cheaper variety, containing a maximum quantity of silica, is procurable. Stones with drawings on them are cleaned and prepared precisely in the same manner as at first.

Transfer-Paper.—Owing to the difficulty of writing backwards on the stone, all pen and line work is executed on prepared paper: by damping the back of this paper, and pressing it on the stone, the transfer of the writing is effected. Drawings may be laid without the use of the paper.

Any ordinary writing paper would answer if it gave up the ink on pressure; but this not being the case, the surface requires to be coated with a preparation, which becomes a medium capable of retaining and giving back the ink or any traces of grease, and adheres to the stone on being pressed. The paper is prepared in the following manner.

Apply three successive coats of the following composition to one side of any smooth paper—dry thoroughly after each coating:—

Prepare starch to the consistency of conjee or gruel; colour with gamboge; strain through a piece of fine muslin: apply with a sponge or piece of cloth.

The quantity of paper to be prepared at a time must depend upon the consumption ; it is advisable not to prepare more than will suffice for a couple of months, as the preparation deteriorates with age. When too old for use, the paper bulges up on the application of water in the process of transferring, and the transfer is imperfectly made. Before being used for writing on, pass the paper through the press, with the prepared side down, on a well polished stone ; this will give it a smooth surface, and preserve the point of the pen.

Transfer-Ink, or ink used in writing on the transfer-paper.—There are various receipts for making this ink, but the following will be found suitable for all purposes :—

Transfer Ink.—No. 1.

Brown soap	2 oz.
White wax	2 „
Tallow	2 „
Shellac	1 „
Mastic	1 „
Lamp-black	5 table spoonsful.

No. 2.

Virgin wax	2 oz.
White soap	½ „
Shellac	½ „
Lamp-black	3 table spoonsful.

No. 3.

White soap	100 parts.
White wax	100 „
Mutton suet	30 „
Shellac	50 „
Mastic	50 „
Lamp-black	30 or 35 „

Fig. 1

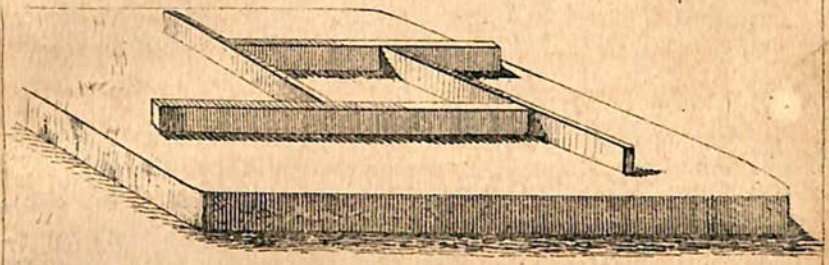


Fig. 2

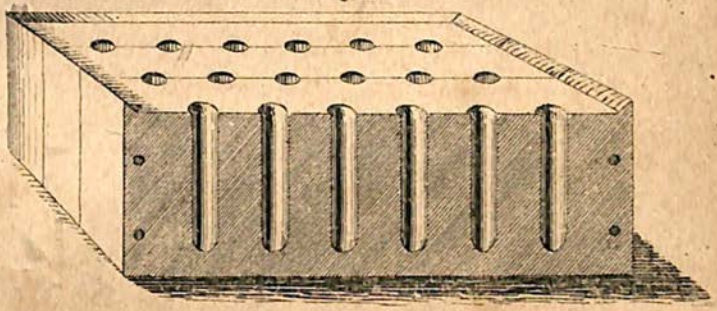
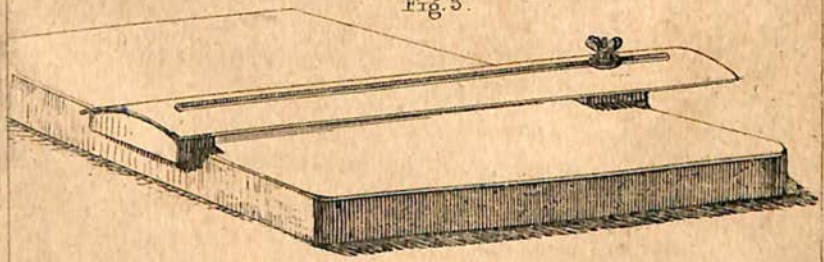


Fig. 3.



Manipulation.—Place a saucepan, well cleaned, over a brisk fire. When the pan has become quite hot, put in the wax, and, when this has melted, add the soap, by pieces, till the whole is incorporated; continuing to stir the mass till it has acquired sufficient heat to ignite. Ignite with the flame of burning paper, and, whilst burning, add the lamp-black and the other ingredients; and, last of all, the shellac, a little at a time. Remove the pan from the fire, and let the contents burn till no trace of scum is observable on the surface; then pour a little on a slab, and, when cold, if it should break clear, reduce the flame, by placing the pot on damp earth, or by pouring water around it, but without letting any drop into it. Immediately on the flame subsiding, pour the composition into a mould, formed by four pieces of wood placed on a slab (Fig. 1, Plate I.), and previously rubbed over with soap. When cold, cut it into convenient sizes for use.

Lithographic ink and chalk are prepared in the same way, of the following materials. The burning, in the preparation of the chalk, must be stopped when, on cooling, the composition breaks sharp and clear; it should then be poured into a mould of the proper form. (Fig. 2, Plate I.) The chalk must be kept in a wide-mouthed stoppered bottle, and put away into a dry place; damp air will affect it detrimentally.

Lithographic Ink.—No. 1.

Tallow	2 oz.
Virgin or white wax	2 „

Shellac	2 oz.
Common soap	2 „
Lamp-black	¼ „

No. 2.

Dried tallow soap	30 parts.
Mastic (fine)	30 „
Carbonate of soda	30 „
Shellac	150 „
Lamp-black	12 „

Lithographic Chalk.—No. 1.

Tallow	2 oz.
Virgin or white wax	2½ „
Shellac	1 „
Common soap	1½ „
Lamp-black	¼ „

No. 2.

Finest white wax	4 parts.
Finest tallow soap	2 „
Pure Russian tallow	2 „
Gum lac	2 „
Lamp-black	sufficient to give colour.

To prepare the Transfer-Ink for Use.—Place a small china cup, with water in it, over a few live coals; in a few seconds the water will bubble up. Take a piece of ink on the end of a wire or stick, and dissolve it in the boiling water till the latter has acquired sufficient colour, but is still of consistency to flow freely from the pen. If the ink is properly prepared, it will retain its fluidity for some time; otherwise it will coagulate after a few hours, and become unfit for use. The failure is caused by the soap not being thoroughly incorporated with the other ingredients.

If the lines, after the transfer of a drawing, or writing, are found to have spread, the ingredients were not

sufficiently burnt: burn again. The stick of dry ink will also feel soft to the touch. When the lines on the stone, after a few impressions, wear off, the ink is over-burnt: melt it again, and add a little wax, and the other ingredients in proportion.

Printing-Ink.—Printing-ink is composed of varnish, made from boiled linseed oil, and fine lamp-black. The oil is boiled in a pot, half filled, till it ignites at the touch of the flame of burning paper; allow it to burn until the body is reduced by one-fourth; throw in a few lumps of sugarcandy; then bottle a portion, and let the remainder burn down by one-half or more, for stiffer ink. Mix one pound of lamp-black, with as much varnish as it will take up, and a little blue, on a slab, with a stone or glass muller. The lamp-black, previous to its being mixed with the oil, should be calcined in an earthen pot, to remove any foreign substance which, if allowed to remain in the ink, would deteriorate its quality.

Excellence in printing depends greatly on the mulling: this is best done by means of a grinding-machine—manual labour is less effectual.

It should ever be borne in mind, that ink made of varnish not sufficiently burnt will soil the stone, and a stiff ink will tear the fine or delicate lines of the drawing.

In preparing the varnish, great care should be taken to prevent accidents from over-heating, and consequent ignition of the oil. It should therefore be boiled

in an open space; and when the oil flares greatly, reduce the fire, and cover the pot close.

Sponge.—Instead of sponge, cloth of coarse texture may be used with advantage for common work; but for chalk drawings, and fine work, sponge is indispensable. The cost of sponge in India being great, it cannot be used in large establishments; but for working a press or two, this item will not add much to the expense. Cloth, being less elastic than sponge, may prove dangerous in the hands of a careless or inexperienced workman, especially with chalk-drawings.

Drawing Pens, &c.—For writing, quills, either goose or crow, may be used. They should be scraped down until as soft and pliable as a camel-hair pencil: mend to a fine point, and the strokes produced will be as fine as can be desired.

Gillott's mapping-pens are well adapted for drawing on stone, but not for writing with on transfer-paper.

The brass rulers and metal drawing pens used are such as are to be found in mathematical instrument cases.

Steel scrapers may be made of small files, fixed into wooden handles; and their points sharpened by grinding. They are used for removing superfluous lines and accidental spots on the stone, where acid cannot be safely applied. Care should be taken to use the edge, and not the point, of the tool, except where absolutely necessary. If not very cautiously used, the point will form a hole, which will gradually become

filled up with printing-ink, and soil the paper in printing.

The *Gum* used ought to be of the best quality, and thoroughly dissolved.

Acid is used in etching the stone after the drawing is finished. It should be kept in a stoppered phial, and, when used, diluted to the proper extent, which varies according to the nature of the work ; but it is in no case to be applied in its pristine strength.

PART III.

TRANSFERRING AND PRINTING.

Transferring.—Having given a description of some of the implements and materials used in the process, and the best methods of preparing them for the artist's and the printer's use, the practice of transferring and printing now remains to be treated of.

The art of lithography may be divided into two parts: 1st, The Execution of the Drawing or Writing, either on stone or on paper; 2nd, Transferring and Printing.

The first requires but little practice, as any writer or draughtsman, after a few trials, may succeed; but the latter is attended with many difficulties. It frequently happens, that a drawing on the stone or paper appears well executed, and the artist believes that it may be printed without difficulty; yet, with all the printer's care and skill, he may never succeed in producing a satisfactory "proof"; the cause of failure being, to the inexperienced, inexplicable. In such cases, the cause of failure is invariably laid at the door of the unfortunate pressman, whereas it has in reality been occasioned by the want either of care or experience on the part of the draughtsman in the use of his materials, or by his not attending to the precautions necessary to ensure success.

The first care necessary in drawing on stone is to protect its surface, which is highly susceptible to grease and water—the slightest touch of the finger is sufficient to impair it. The artist cannot be too cautious in handling it: after transferring the outline of his sketch, he should cover the whole surface of the stone with a sheet of stout paper, the edges being gummed or pasted down, and torn away as the work progresses; and a bridge should be used as a rest for the hand. (Fig. 3, Plate I.)

The quickest and simplest way of transferring the outline of a drawing is to copy it on transparent tracing-paper with red chalk; then place it on the stone, facing the prepared side, and pass it through the press.

Drawing on stone is similar to drawing on paper with black-lead, but there is a peculiarity in the touch or handling of the crayon which can only be acquired by practice. It must be applied with firmness sufficient to fix the faintest line on the stone in such a manner that neither etching nor sponging will efface it. The crayon (or stick of chalk) should be pointed for use; not, however, like a black-lead pencil, but by a reverse operation, *i. e.* by cutting *from* the point.

Flat or aërial tints are not executed as on paper, but by a series of fine lines; and for depth of shade these are crossed diagonally, excepting in fore-grounds and foliage.

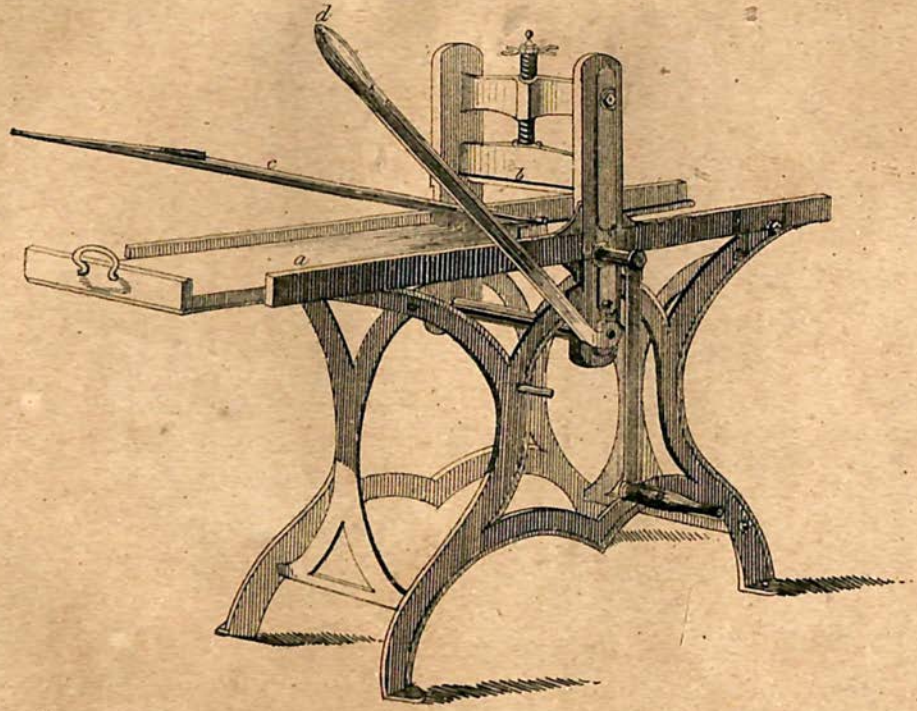
The stone should be gently brushed with a flat

camel-hair pencil before the work is commenced, and once or twice during the day, to free it from dust ; but it should never be blown on, as the breath will damp it, and prevent the crayon working freely. A uniform temperature should be maintained in the drawing and printing rooms, and dust, smoke, &c. excluded as much as possible.

The process of transferring differs in some instances, as when drawings are made on transfer-paper, and transferred to stone. Great tact is required to effect this properly.

A polished stone is warmed, placed on the press, and levelled. The back of the paper containing the drawing is damped, and put between two sheets of blotting-paper, to remove any excessive moisture or water on the prepared side. It is next laid on the stone, and passed through the press three or four times, always from the off end. The stone is then turned round, and pressed again as many times, to provide against any flaw in the scraper or tympan. Water is now poured on the back of the paper, to soften it, and cause it to come away from the stone freely ; and the paper being then pealed off gently, the drawing is found to be transferred.

After the transfer is effected, the stone, if still warm, should be allowed to cool. To ascertain its temperature, the back of the hand should be held within half an inch of the surface of the stone, at which distance, if warm, the heat will be felt.


d
c
b
a

On the stone cooling, it is first etched with gum and acid, or *cookum* (this is applied all over with a sponge, and washed off with water), then inked, a proof taken, and all errors rectified.

Printing.—Etching.—A stone, with a sketch drawn on it, is prepared for printing by etching, which is effected by holding the stone in a sloping position on a trough, and pouring, from the top, diluted acid, of the strength of one to one hundred of water. The ends are then reversed, and the operation repeated, in the case of delicate drawings. Pure water is next thrown over, to wash off the acid and prevent its further action. The stone is then gummed, and, if containing a chalk-drawing, put aside until the following day; if writing, it is ready to print from.

The object of etching the stone is to remove any dust which, in graining or polishing, may have filled up its pores—also to destroy any small greasy particles which may have adhered to it, and to neutralise the soap or alkaline in the chalk or ink, and so render it insoluble in water; the gum fills up the pores, so that the printing-ink will not adhere where it is not required. The risks to be encountered in this operation lie in the strength of the acid. If too strong, the delicate tints of the drawing will soon disappear; it is, therefore, safer to etch with weak than with strong acid, as there is a remedy, in case of defect, in the repetition of the process.

When prepared for printing from, the stone is

placed on the platten, or box of the press (*a* Fig. 1, Plate II.), with blanket or felt below, and adjusted. The scraper *(b)* of the press should then be examined, to see that it is true to the surface of the stone: to prove this, move the platten, with the tympan *(c)* down, till the off end of the stone is under the scraper holder; lower the handle *(d)* of the lever, screw down the scraper, and, after the proper pressure is attained, relax the lever, the scraper remaining fixed, and move the platten half way, when, by means of the lever, again ascertain the pressure, as before, and once more at the near end of the stone. When the pressure is uneven, it must be regulated by compensating pieces of thick paper, folded and placed under the uneven end of the stone. The press and stone will now be ready for work; preparatory to which, wash a portion of the gum off the stone, and pass the roller with printing-ink over, until the drawing is evenly charged. At first, the drawing will not take the ink readily, but by repeated movements of the roller every part will be charged. A sheet of paper should next be laid on, the box brought under the scraper, the lever lowered, and the whole turned through the press by the handles *(e e)* of the moving cylinder; the lever is then relaxed, the box drawn out, and the paper gently removed. The stone should be sponged instantly, after sprinkling a few drops of water on it, and the operation repeated for new impressions.

Some gum should always be retained on the stone while printing, otherwise it will take the ink and soil the paper in use. If, by too much wetting or sponging, the gum is removed, fresh gum must be applied; and if any spots appear, in printing, which are not intended to be visible, they should be removed with acid, or by the scraper; and gum-water applied, to close the pores of the stone.

In some cases, notwithstanding all precautions, the stone may still seem inclined to run "smutty": roll it with printing-ink, and then clean it with a mixture made of equal parts of gum, salad or olive oil, and turpentine, put into a bottle and shaken till it froths. The cause for the stone or drawing running smutty lies in the ink being too liquid, and dissolving and spreading on the stone: use stiffer ink, after cleaning the stone with the above mixture. On applying the mixture, the drawing will appear quite obliterated, but on charging it with printing-ink, the whole will reappear as clean and sharp as at first. The turpentine in this instance simply decomposes the superfluous ink, the olive oil nourishes the greasy lines, and the gum preserves the stone.

The following accidents and defects may also occur during printing; they will be seen either on the stone, or on the paper after each impression:—

1. The whole length of the impression is marked with light streaks.—[The scraper is notched; plane it.]

2. Part of the impression is wanting.—[The

scraper or tympan is not level: if scraper, level it; if tympan, paste paper.]

3. The impression looks ragged, and appears to have spread all in one direction.—[This is owing to the pressure not being sufficient to cause the paper to take up the whole of the printing-ink, which, accumulating from imperfect pressure, spreads in the direction of the scraper: increase the pressure till the printed side of the paper appears glossy.]

4. The impression looks soiled.—[Very often from the bad quality of the printing-paper: change it. Water will also prove a source of annoyance in this way, if not sufficiently pure; rain-water is recommended.]

The paper to be printed on should be damped to such a degree as to remove its stiffness in the dry state. It should be damped through, but not *wet.*

Colour
Printing.

PART IV.

PRINTING IN COLOURS, &c.

'Besides the processes already described, there are others very necessary for the lithographer to be acquainted with. The first of these is printing from two stones, with different coloured inks.

Beautiful effects may be produced by this means, giving the appearance of crayon drawings on tinted paper, touched with white chalk. (See Frontispiece.) The principal drawing is made in the usual manner, on a grained or polished stone, and an impression taken therefrom is, while still fresh and wet, transferred to another stone (previously covered with a composition made as per receipt given below), by being passed through the press. A counter-impression will be found on the second stone, showing the drawing distinctly, and from this the parts intended to be white are taken out entirely with the scraper; the half-tints somewhat less; and the whole etched with strong etching water.

Melt in a saucepan two parts wax to one part soap, and add a little vermillion to colour it. Cast into sticks. For use, rub in water till as thick as cream, and apply with a flat camel-hair brush.

Take an impression from the second stone in any chosen colour, then print from the first stone in black,

care being taken to have marks or small holes on the latter, beyond the drawing, corresponding with similar marks on the second stone, so that the parts may print into their exact places ; otherwise the effect will be entirely spoiled. The paper is laid on the marks with pins. (Plate III.)

Coloured inks are differently made, according to the required tints ; but varnish of itself makes very good browns of different shades.

Chromo-lithography is much the same as the foregoing, the only difference being that the first drawing is made in outline, and transferred ; copies on transfer-paper are then taken, and transferred to as many other stones as there are colours in the painting to be copied. Thus, each colour has a separate stone, and is printed into its proper position separately, as with tints.

Transfers from Copper-plates, &c.—Fresh impressions of lithographs, or from steel and copper plates, type, and wood-engravings, may be transferred to stone, to expedite work, or to preserve the plates, &c. The transfer-ink used is made of lithographic ink, thinned with oil of turpentine, and mixed with printing-ink ; and the impression should be taken on slightly damped transfer-paper. For transfers from copper-plates, the ink is different, and may be made from either of the following receipts, the manipulation being similar to that observed in making up transfer-ink ; it should, however, when cold, be as hard as pitch.

No. 1.

Brown soap	3 parts.
Tallow	1½ „
Wax	4 „
Shellac	5 „
Black pitch	5 „
Lamp-black	2½ „
Varnish	2 table spoonsful.

No. 2.

Brown soap	2½ oz.
Tallow	2½ „
Wax	2½ „
Shellac	2 „
Burgundy pitch	5 „
Varnish	2 table spoonsful.

Paper for pulling impressions from copperplates :—

Put two table spoonsful of fine plaster of Paris into a basin ; pour in water, a little at a time, stirring briskly till the whole is well slaked ; add (same quantity as of stucco) good binder's paste, made of flour ; strain through muslin : apply with a flat camel-hair brush, over good stout printing-paper.

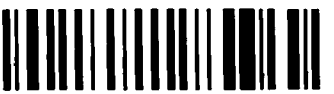
To pull impressions on the above paper, the plate is warmed over a stove, inked in the usual manner, and an impression taken on the prepared paper at a copperplate press. The transfer is effected in the ordinary way, and subjected to the same preparation for printing.

Etching (or Engraving) on Stone.—This is a very useful process, and easily practised. A polished stone is etched with acid, smeared with gum, and allowed to dry. The superfluous gum is next washed off, and the surface of the stone, when dry, rubbed over with vermillion. The drawing is then traced through the

coating with a fine hard steel-pointed needle, fixed into a wooden handle. When finished, the stone is rubbed all over with linseed oil, washed with water, and the engraving charged, at first with printing-ink on a rag, to fill the lines, and afterwards with the roller. Lay four or five sheets of soft paper over the stone when pulling, and the drawing will come up firm.

The stone should be warmed a little, so that the needle may work freely through the coating; and it should not be breathed upon, as the damp will dissolve the composition, and fill up the engraving.

A variety of styles executed in the above manner may be transferred to one stone, and printed from it on the same sheet, with facility. Etching is well adapted for drawings, plans, cards, &c., and many beautiful specimens of this style of lithography have been produced—equal, indeed, to the finest copperplate engraving.



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